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NOISE STUDY

TO: Brian Allen
COMPANY: KJK Wireless
FROM: Allan Beaudry {allanb@noise-control.com}
DATE: October 31, 2013
SUBJECT: Noise Evaluation, AT&T Cell Equipment, 196 West Street,
Paxton, Massachusetts (Site # MA4388)

INTRODUCTION

Noise Control Engineering, Inc. (NCE) has been retained by KJK Wireless to perform a noise evaluation for an AT&T Mobility communications facility at 196 West Street in Paxton, Massachusetts. The sound-generating equipment proposed for the site are two Marvair AVP48 Compac II air conditioning units and an enclosed Generac, model SG050, 50 kW backup generator.

NOISE LIMITS

The Town of Paxton zoning bylaws Section 8.6.11 outlines the noise guidelines for personal wireless facilities as follows:

Ground-mounted equipment for personal wireless service facilities shall not generate noise in excess of ten (10) dBA above the ambient sound level between 7:00 P.M. and 7:00 A.M. based on measurements taken at the property line.

This nighttime overall limit is functionally identical to that provided by the Massachusetts Department of Environmental Protection noise ordinance. To satisfy these requirements, NCE performed a background noise survey to determine the average nighttime current ambient levels.

BACKGROUND NOISE SURVEY

NCE collected background noise measurements using an unattended noise monitor located in a tree on the subject property. An aerial image, shown in Figure 1, indicates the location the installed sound level meter. Measurements were collected from the evening of October 9, 2013 to the morning of October 23, 2013. This data is shown in Figure 2. The average measure nighttime L_{90} sound pressure levels were calculated for each day of measurement. Results are given in Table 1.

TABLE 1: Summary of Background Noise Data.

DATE	L ₉₀ , dB(A) re: 20 µPa
10/9/2013	33.7
10/10/2013	31.4
10/11/2013	32.5
10/12/2013	45.6
10/13/2013	33.7
10/14/2013	41.2
10/15/2013	39.3
Average	37

NOISE EVALUATION RESULTS

To determine the acoustic impact of the new cell site the property line sound pressure levels (SPL) from the air conditioning units and the backup generator were determined. The “source” sound pressure levels provided by the two equipment vendors are given in Table 2. The air conditioning unit was measured at a distance of 5 feet and the backup generator was measured at a distance of 23 feet (7 meters).

TABLE 2: Equipment Source Sound Pressure Level at Distance

Unit	SPL (dBA)	Distance (feet)
Marvair AVP48 Compac II	72	5
Generac, model SG050, 50 kW backup generator (Level 2 Enclosure)	71	23

To calculate the noise levels at the property lines, NCE used the Table 2 sound pressure levels with further attenuation for spherical spreading. NCE determined distances between the equipment and the property lines at four locations in the four cardinal directions using the Zoning drawing, reference [1], sheets C-1 to C-3. The four locations are shown in Figure 3. No significant noise attenuation will be provided by shielding of the subject building to the property line locations. Therefore this factor was set to 0 dB. Table 3 contains the calculations of the projected HVAC noise levels at the property line for each direction. Table 4 contains the calculations of the projected backup generator noise levels at the property line for each direction.

TABLE 3: Calculated HVAC SPL at the Property Lines in dB(A)

Direction	North	South	East	West
Sound Pressure Level at 5 feet (single unit)	72	72	72	72
Total Sound Pressure Level at 5ft (two units)	75	75	75	75
Total Distance To Property Line, ft	240	1120	515	508
Minimum Roof Barrier Attenuation, dB	0	0	0	0
Calculated SPL @ Property Line, dB(A)	41	28	35	35
Nighttime Average Background Noise	37	37	37	37
Paxton Nighttime Limit (background + 10 dB)	47	47	47	47
<i>Excess to Limit</i>	-	-	-	-

TABLE 4: Calculated Backup Generator SPL at the Property Lines in dB(A)

Direction	North	South	East	West
Sound Pressure Level at 23 feet (single unit)	71	71	71	71
Total Distance To Property Line, ft	240	1120	515	508
Minimum Roof Barrier Attenuation, dB	0	0	0	0
Calculated SPL @ Property Line, dB(A)	51	37	44	44
Nighttime Average Background Noise	37	37	37	37
Paxton Nighttime Limit (background + 10 dB)	47	47	47	47
<i>Excess to Limit</i>	4	-	-	-

CONCLUSIONS

Noise monitoring was performed for a period of one week to determine the average nighttime background noise level as required by the Town of Paxton zoning bylaws. The average nighttime noise level (L_{90}) between the hours of 7:00 P.M. and 7:00 A.M. was found to be 37 dB(A). The bylaw forbids any personal wireless facility to produce a noise in excess of 10 dB greater than this background level resulting in a nighttime noise limit of 47 dB(A). No daytime limit is specified.

The calculated sound pressure levels for the HVAC units range from 28 to 41 dB(A). The highest predicted level occurs at the northern property line. In all directions, the predicted SPL for the HVAC units are no greater than 10 dB above the average nighttime background level of 37 dB(A).

The calculated sound pressure levels for the Backup Generator unit range from 37 to 51 dB(A). The highest predicted level is again on the northern property line which exceeds the 47 dB(A) limit by 4 dB. Note that this property line is currently uninhabited, and, more importantly, the generator will operate only in the event of a power outage or weekly for short durations during the daytime hours for

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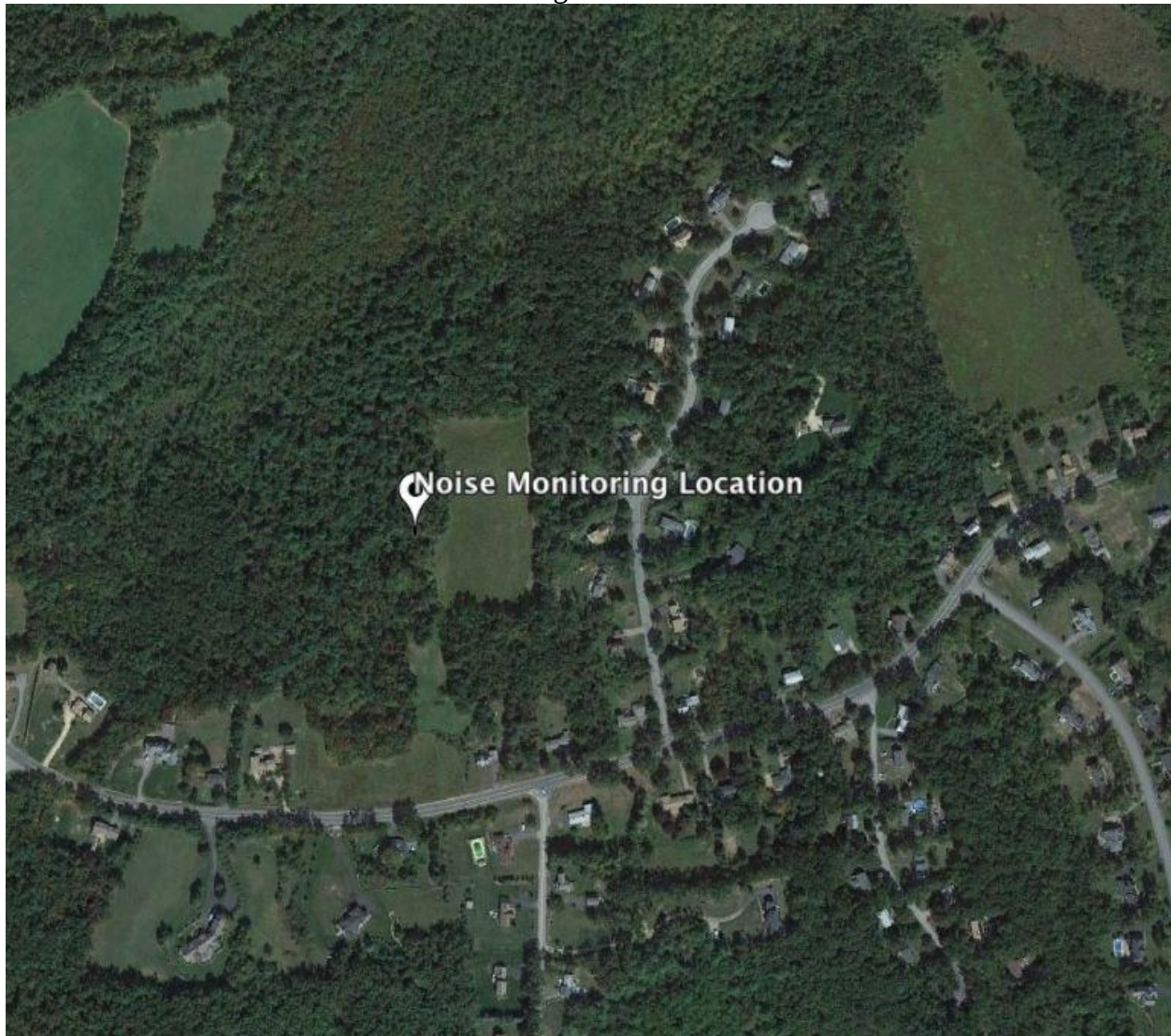
maintenance purposes. As there is no daytime limit, these regular short duration maintenance operations will not produce a noise excess.

NCE believes the predicted noise levels given herein are reasonable and the proposed site will comply with all Town of Paxton personal wireless facility noise regulations under normal operating conditions. The sole predicted excess occurs on the northern property line when the backup generated is operated at night. This would occur only during an extended power outage.

REFERENCES

1. AT&T Mobility Drawing (prepared by Dewberry Engineers Inc.), Paxton Mass, Site MA4388, 196 West Street Paxton, MA 01612 Rev A, dated 7/02/2013.

FIGURE 1: Aerial View of Noise Monitoring Location



Background Noise Survey: MA4388

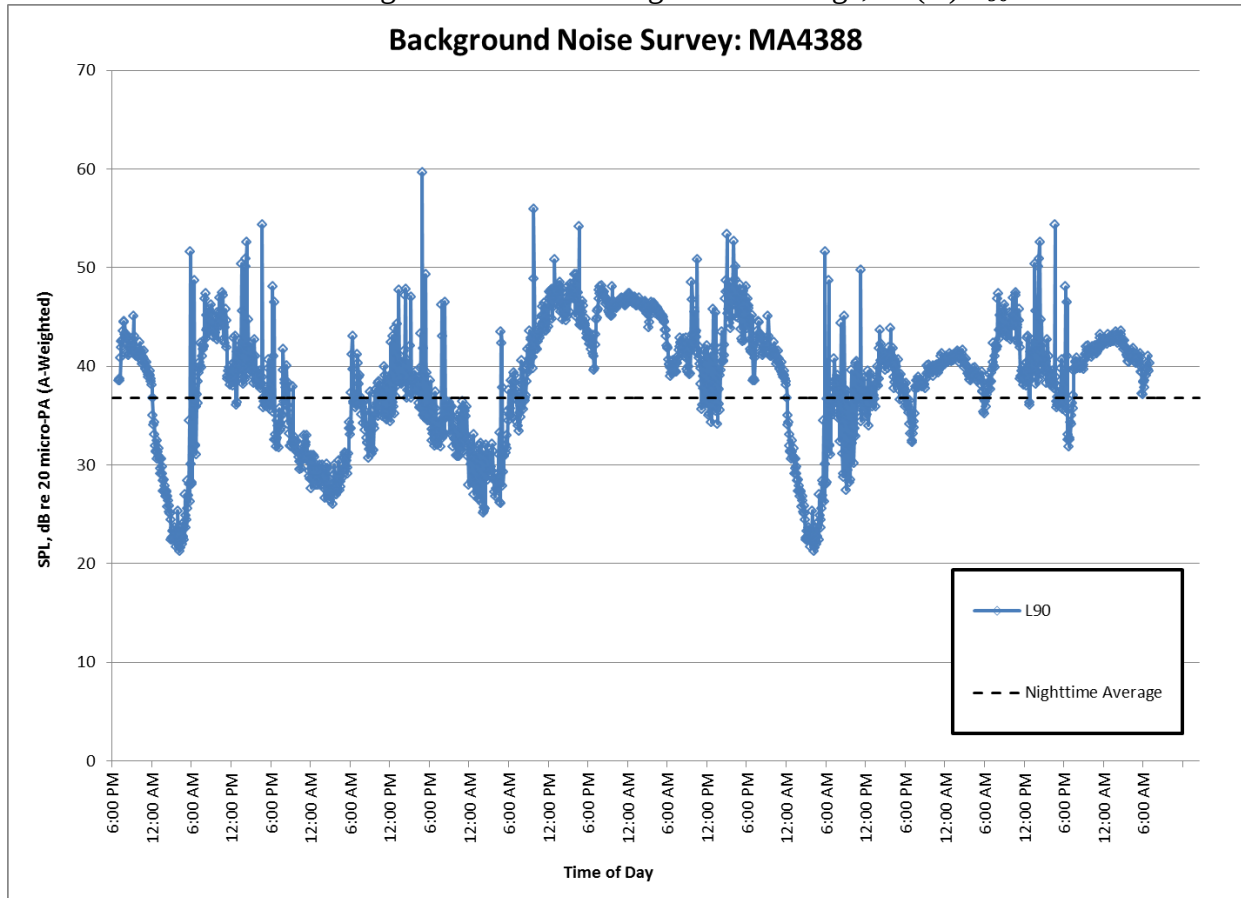


FIGURE 3: Property Line Prediction Locations

